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Claims

1. A system for operating a storage area network (SAN) in a server environment in which multiple servers share one Fibre Channel adapter, the system comprising
  - a SAN Management Server,
  - a Fiber Channel Network providing a connection to storage devices, and
  - a plurality of Operating System Images running in said server environment,  
characterized by
    - a trusted SAN Management Client Unit being connected to said SAN Management Server,
    - a Fiber Channel adapter (FC adapter),
    - whereby the trusted SAN Management Client Unit is configured to issue commands in said Fiber Channel Network in place of each of said Operating System Images (OS Images).
2. The system according to one of the preceding claims, wherein said SAN Management Server is configured to distinguish a first set of commands and a second set of commands, whereby the first set of commands are processed by the SM Client together with said SAN, and whereby said second set of commands are processed by said OS Images without access to said SAN.
3. The system according to one of the preceding claims, wherein said SAN Management Client is configured to distinguish a first set of commands and a second set of commands, whereby the first set of commands are processed by the SM Client together with said SAN, and whereby said second set of commands are processed by said OS Images without access to said SAN.

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4. The system according to one of the preceding claims, wherein the server environment includes virtual servers.
5. The system according to one of the preceding claims, wherein the server environment includes partitioned servers.
6. The system according to one of the preceding claims, wherein said Fiber Channel adapter (FC adapter) is configured to authenticate said trusted SAN Management Client Unit.
7. The system according to one of the preceding claims, wherein said FC adapter and said SAN are adapted to restrict the access of the untrusted OS Images to the minimal necessary set of commands.
8. The system according to one of the claims 1 to 5 wherein said FC adapter and a virtualization layer of the virtual server are adapted to restrict the access of the untrusted OS Images to the minimal necessary set of commands.
9. The system according to one of the preceding claims, wherein only one SM Client is provided in order to keep the server load small.
10. The system according to claim 8, wherein one or more backup SM Clients are provided to provide redundancy.
11. The system according to one of the preceding claims, wherein only the SM Client is registered for receiving messages from the SAN and the SM Client is configured to forward said messages only to said SM Server.

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12. The system according to one of the preceding claims, wherein the FC Adapter is configured to forward all messages generated by the SAN for which a registration is not necessary solely to the SM Client and not to the untrusted OS Images.

13. The system according to one of the preceding claims, wherein the FC Adapter is configured to forward a copy of all messages generated by the SAN for which a registration is not necessary to the SM Client in addition to forwarding the original message to the untrusted OS Images.

14. The system according to one of the preceding claims, wherein the server is equipped with two classes of agents, namely, the SM Client and a Remote Access Server (RA Server).

15. The system according to claim 14, wherein the SM server is equipped with repository for keeping authorization data for accessing the RA Server.

16. The system according to claim 14, wherein the SM Client is equipped with repository for keeping authorization data for accessing the RA Server.

17. The system according to one of the preceding claims, wherein the SM Client and the FC adapter are configured to gather reliable information used for billing the use of resources by each untrusted OS Image.

18. The system according to one of the preceding claims, wherein the SM Framework is adapted to communicate with a Firewall control application, in order to set the access rights.

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19. The system according to one of the preceding claims, wherein the SM Client is adapted to function as a router for the requests from the SM server to the RA server.

20. The system according to one of the preceding claims, wherein the RA Server is formed by an existing telnet/sshd server.

21. A method for operating a storage area network (SAN) in a server environment in which multiple operating system images share one Fibre Channel adapter, the method comprising the steps of:

managing the SAN by a SAN Management software with at least a SAN Management server and at least a SAN Management client with a communication path to said Fibre Channel Adapter,

separating the requests issued by the SAN Management server into at least two groups,

a first group is processed by the Fibre Channel adapter and the SAN on behalf of the SM client in place of other operating systems which share the same adapter, corresponding to a trusted path, and

a second group is processed by the other operating systems without the need to send or receive requests to or from the FC adapter and the SAN.

22. The method according to claim 21, further comprising the step of:

routing all information contained in unsolicited messages generated in the SAN and FC adapter to the SAN Manager by the SAN management client.

23. The method according to claim 21 or 22, further

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comprising the step of:

using the HBA\_API binding requests to modify the firewall.

24. The method according to one of the claims 21 to 23, further comprising the step of:

operating the communication path from the SAN Management client to the adapter so that it cannot be modified or eavesdropped by another operating system image.

25. The method according to one of the claims 21 to 24, further comprising the steps of:

accessing all information relevant for billing individual operating system images generated in the adapter and SAN only through the SAN client on the trusted path.

26. The method according to one of the claims 21 to 25, further comprising the step of:

said SM server providing authorization data to the SM client to execute requests from said first group.

27. The method according to one of the claims 21 to 26, further comprising the step of:

said SM server and SM client providing authorization data to the other OS images to execute requests from said second group.

28. The method according to one of the claims 21 to 27, further comprising the step of:

operating the OS images so that they are only enabled to execute a limited command set in the SAN.

29. A computer program product stored on a computer usable

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medium, comprising computer readable program means for causing a computer to perform a method according to anyone of the preceding claims 21 to 28.